TRANSPORTATION RESEARCH
BULLETIN
A Publication of Idaho Transportation Department Research

Vol. 1, No. 4 Summer 1998

FY99 Research Projects Selected

The Process:

The ITD Research Advisory Committee held their annual meeting in two parts this year for the purpose of selecting new research projects to be included in the Fiscal Year 1999 Work Program. The first meeting was held on 22 July 1998 and the second on 18 August 1998.

Twenty-six projects were submitted for review at the first meeting: one from Traffic, one from Maintenance, one from District Five, seven from Boise State University and 16 from the National Institute for Advanced Transportation (NIATT) at the University of Idaho. The two universities' proposals were developed in collaboration with Department staff. Following the presentations, Committee Chairman Bob Smith recommended deferral for five of the NIATT proposals and four of Boise State's proposals. The District Five proposal was also deleted from further consideration.

At the second meeting, additional information was presented for each of the deferred projects as well as several projects that had already been approved at the first meeting. Following these presentations, representatives from the US Geological Survey presented a new proposal in cooperation with the Design Section. A new ballot was then cast. With the exception of the project that had been deleted at the first meeting, all of the projects were eligible for consideration.

Following the presentations, the Committee conducted a final ballot to prioritize the proposals. The sixteen top vote getters were included in the FY99 Work Program. These included a total of four submitted by Boise State University; 10 submitted by the University of Idaho, NIATT; and two proposed by Department staff. Technical committees will be established for each project and will be responsible for putting together the final Work Statements, budgets, staging plans, etc.

Continued on Page II, Col. 1

AASHTO RAC Meets in Nashville

Affects of New Federal Legislation of Primary Interest

The 1998 AASHTO Research Advisory Committee (RAC) held their semi-annual meeting in Nashville, Tennessee during the first week of August. Most state DOTs were represented along with the FHWA and the Transportation Research Board (TRB). Guest speakers were also in attendance from a number of public and private research organizations. The three day meeting covered such diverse topics as the impact of the new federal highway legislation on federal and state research programs, self evaluation, implementation of new technology, management of research and development, cooperation and partnerships, transportation information systems, status and direction of

Continued on Page IV, Col. 1

Technical Committees Play an Important Role in Research

With the approach of Fall, the Department is about to embark on a new round of research projects. Many of these will involve new researchers and/or technical contacts within the Department. New **Technical Oversight Committees** are being formed for each of the research projects that have been selected for inclusion in the Department's Annual Work Program. It appears timely, therefore, to review the important role that these committees play in ensuring that research leads to the timely implementation of cost effective and critical new products and processes.

A Researcher's Perspective:

Michael Kyte, Director of the National Institute for Advanced Transportation Technology at the University of Idaho was asked to offer his thoughts on the roles and

Continued on Page III, Col. 2

FY 99 Research (Cont. from Page I, Col. 1)

Even though the Department is receiving more research funds under TEA-21, there will be more requests for pooled fund projects and NHCRP projects to cover national programs that lost their funding under the new bill. This will reduce the funds available for new Department initiated research.

The Chosen:

	PROJECT TITLE	RES. AGENCY	ITD TECHNICAL CONTACT
1.	**Vegetation Management Practices for Soil Stability, Erosion Control and Slope Maintenance**	U of I	G. Ross, Maint
2.	**Revisions and Modifications to WINPSBRG (Prestressed Bridge Girder Design Program)**	U of I	M. Farrar, Br Des
3.	**Demonstration Project for Revegetation of Highly Erodible and Steep Slopes**	ITD	Gene Ross, Maint & R. Jost, Envir
4.	**Rock Fall Hazard Classification and Mitigation - Phase 1**	U of I	K. Knottingham, Dist 3
5.	**Monitoring and Modeling Subgrade Soil Moisture for Pavement Design and Maintenance in Idaho, Phase 3: Data Collection and Analysis**	U of I	R. Smith, Mtls
6.	**Evaluation of Earthwork Savings in Road Design using ROADZ**	BSU	S. Hutchinson, Design
7.	**Upgrade and Metrification of the Idaho Overlay Design Program, WINFLEX**	U of I	R. Smith, Mtls
8.	**Using GPS Technology to Update the Idaho Transportation GIS**	BSU	T. Marks, Plng Div
9.	**Economic Impact of Work Zone Travel Time Delays - Phase 2**	U of I	G. Laragan, Dist 3 & B. Breen, Maint
10.	**Microstrain Transducer Engineering Data Acquisition System Prototype Development - Phase 3**	ITD	M. Latta, Traf
11.	**Beneficial Effects of Lime on Asphalt Cement and Asphalt Cement Concrete Mixtures**	BSU	T. Baker & R. Smith, Mtls
12.	**Development of Microstation Tools to Compute Circuit Requirements or Lighting Design Elements - Phase 2**	U of I	T. McAdams, Traf
13.	**Development, Adaptation, and Monitoring of Interactive Training Courses to Idaho Transportation Department's Intranet and World Wide Web**	U of I	B. Drewes, HRS
14.	**Triaxial Compression Test Method of Bituminous Mixture Design**	BSU	R. Smith & D. Winn, Mtls
15.	**Performance Prediction Using Densification Characteristics of Idaho Superpave Mixes**	U of I	R. Smith, Mtls
16.	**Fleet Vehicle Demonstrations of Alcohol-Water Fuel and Catalytic Ignition Systems**	U of I	L. Faulkner, Pub Transp Div & C. Sullivan, Maint

The Objectives

(Research Project 121, Phase III) **Upgrade of the Idaho Overlay Design Program – WINFLEX.** The WINFLEX program was developed for WINDOWS 95 and WINDOWS NT operating systems in Phase II of Research Project 121. This Phase of the project will review the performance prediction models and temperature corrections and metric capability built in. The interface program as well as the SYSAN FORTRAN code will be modified to allow for models upgrade and metric calculation.

(Research Project 124, Phase III) **Monitoring and Modeling Subgrade Moisture for Pavement Design and Maintenance in Idaho.** The objective of this project is to monitor and evaluate moisture conditions in the subgrade and base in pavement sections constructed with both open-graded rock base (Rock Cap) and conventional crushed aggregate base. Frost depth, soil temperature, moisture content, and deflection measurements will be included. With these data, the value of the "Rock Cap" in increasing pavement life and in allowing a thinner surface course will be evaluated. Monitoring equipment procurement and installation was included in Phase II. This Phase will include the data acquisition and analysis.

(Research Project 129, Phase II) **Economic Impact of Work Zone Travel Time Delays.** The objective of this project is to develop a uniformly applied methodology to calculate the costs associated with traffic delays and safety factors resulting from construction projects.

Continued on Page VI, Col. 1

Maintenance of Roadway Surfaces Benefits from Research

By Bryon Breen – Assistant Maintenance Engineer

Research, such as the Strategic Highway Research Program **(SHRP)**, has shown that one of the most cost effective operations in maintaining roadway surfaces is preventive pavement maintenance. Maintenance techniques, such as: sealing of cracks, chip seals, slurry seals, microseals, and others applied at the proper time in the pavement's life can delay the need for more expensive pavement rehabilitation. By performing preventive maintenance, the pavement can be kept in better condition, thereby providing a higher level of service to the public for a longer period of time.

The concept of pavement preventive maintenance is to apply the proper maintenance strategy early, before the pavement deterioration rate begins to accelerate rapidly. The right time to apply preventive maintenance is usually when the pavement is in good to fair condition, **before** serious deterioration has begun. Sealing cracks early will reduce water infiltration and lessen the opportunity for other contaminates to reach the base, thus preventing weakening of the pavement structure. Surface treatments such as chip seals, slurry seals and microseals can seal the narrow cracks as well as reduce the rate of oxidization of the asphalt pavement.

While chip seals have been around for a long time, slurry seals (in particular microseals) are a newer technique in pavement maintenance. Innovative techniques such as microseals provide more options for maintaining pavements. Other innovative materials and equipment, such as spray injection patching equipment and **PERCOL** are providing more cost-effective options to keep pavements maintained. The proper technique used at the proper time will result in reduced overall cost to the taxpayer and a higher level of service to the traveling public.

On gravel roads, the use of chemicals such as Magnesium Chloride can reduce dust and help stabilize the surface, thereby reducing overall maintenance cost as well as providing a higher level of service. Many of these chemicals are not detrimental to the environment when used properly. By stabilizing the surface of the roadway, the need for grading can be reduced. ❁

Technical Committee (Cont. from Page I, Col. 2

responsibilities of a **Technical Oversight Committee** from the perspective of a project Principal Investigator. He offered the following observations:

> Work with the Principle Investigator in the development of the project's Scope of Work, deliverables and budget.
>
> Be willing to understand the project, appreciate its importance, care about or have a stake in its outcome, desire positive results from the project team, and be willing to provide helpful and constructive criticism on the project to members of the team.
>
> Meet regularly with the Principle Investigator and other members of the project team to review progress of technical work, and discuss and attempt to resolve problems as they arise.
>
> Read progress reports, interim reports and final reports; provide timely feedback.
>
> Review final product and make suggestions for effective technology transfer and training activities that would apply the results of the research project to real world problems.
>
> Help to identify future research directions and continuation projects as warranted by the research.

The Department's Perspective:

The above described role and responsibilities of **Technical Oversight Committees** meshes directly those contained in the Department's Materials Manual. The following are excerpts from the section covering research activities.

"Performance of the work will be in accordance with a detailed proposal and budget approved by the **Technical Oversight Committee** for the project." **(160.1)**

"The chair of the **Technical Oversight Committee** shall review the progress report (DH 771) and act as the independent second reviewer of the invoice." **(160.2)**

"The **Technical Oversight Committee** established for the project is responsible for the coordination and surveillance of the contractor's work. Coordination means the guidance of the contractor to keep the work

Continued on Page IV, Col. 2

AASHTO RAC (Cont. from Page I, Col. 2)

Intelligent Transportation Systems (ITS) and the experience of state DOTs to date with Peer Exchange.

Impacts of TEA 21:

The opening session kicked off the meeting with a series of speakers addressing the impacts of **TEA 21** on transportation research from the perspective of their respective organizations. This subject colored much of the discussion during the three days and was the focus of two sessions on the second day.

Allen Abbot, Chairman of AASHTO Subcommittee on Research (SCOR), summarized **TEA 21** by indicating that it reduces the FHWA role in highway research, decreased SHRP and LTTP funding, increased earmarking for Universities and increased State Planning and Research (SPR) money for states. This is predicted to cause some major changes in research in this country. How each state uses its new SPR money will really make an impact in the national focus of research. For example, SHRP's Long Term Pavement Performance (LTPP) program needs $15 million to continue, and **TEA 21** has only provided $10 million. How will the shortfall be covered. States will have many demands placed on their increased SPR money. Each of the states needs to come up with a procedure to ensure that transportation research keeps its focus. The relationship between FHWA and the states has changed significantly.

Robert Betsold of the FHWA reported that the FHWA is still sorting out what **TEA 21** means to the research program. Research funds are now under the obligation limitations, resulting in a 10.9% reduction for the 1st year and then an annual 10 % reduction. Earmarked funds come off the top, thereby reducing flexibility. There has also been a loss of the use of takedown funds. One or more AASHTO committees are involved in each program, providing input on what priorities should be.

Robert Skinner from the TRB led off his remarks by indicating that research has paid off, pointing out that breakthroughs in materials, safety and planning contributed to the success of the Interstate system. This research has primarily been a public sector program. The transportation program has never approached the spending levels of industry in research - 0.3% vs. 3%. Research costs while innovation saves money.

Continued on Page VIII, Col. 1

Technical Committee (Cont. from Page III, Col. 2

directed along paths of potential benefit as set down in the proposal. Surveillance means monitoring of the work to assure it is in accordance with the terms of the contract with respect to level of effort, adherence to time schedule, conformance with the approved work plan and submittal of required reports." **(160.3)**

"Criteria for suspending and/or discontinuing a project must consider whether the project has potentially any chance of success, priority of other work, personnel availability, etc. Projects shall not be suspended or discontinued voluntarily by a division, bureau, section or district, but if the need exists, explanations and recommendations should be directed to the Research Engineer and **Technical Oversight Committee** (if one is set up for the project) for action." **(170.1)**

"Special items needed for the research project shall be purchased by the section or district with the approval of the responsible unit supervisor, the Research Engineer and/or the **Technical Oversight Committee** set up for the project." **(170.2)**

"The **Technical Oversight Committee** and/or the Research Engineer will review project costs, procedures, and purchases. The Research Engineer will be kept advised as to project needs." **(170.2)**

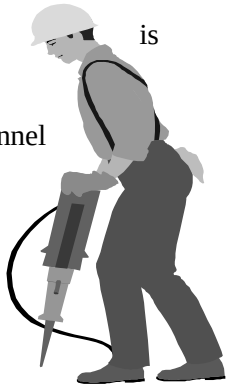
"The Division Heads, Bureau Chiefs, District Engineers or Section Supervisors and/or the **Technical Oversight Committees** assigned to the project and the Research Engineer bear primary responsibility to counsel and advise the Principle Investigator." **(170.3)**

"Coordination of efforts between divisions, bureaus, sections and districts who may jointly pursue a project is to be the responsibility of the Division Heads, Bureau Chiefs, District Engineers and Section Supervisors involved together with the Research Engineer and the **Technical Oversight Committee**." **(170.3)** ❁

New Ways to Deal with Potholes

By Barry Gwin – Maintenance Quality Specialist

By the time winter has ended and the spring flowers start to appear, the public is looking forward to warmer weather and smooth roads. However, most maintenance personnel recognize that Spring means it is time for potholes.



The Idaho Transportation Department is always looking for more efficient and safer ways to patch potholes, for the benefit of both the maintenance personnel and the traveling public. Two new pieces of equipment helped ITD maintenance personnel in repairing spring potholes this year. They are the **Poweray Infrared Heat and Serve** and the **Durapatcher** velocity patcher.

Poweray Infrared Heat and Serve:

The **Poweray Infrared Heat and Serve** is a trailer mounted infrared system capable of heating an area up to six by eight feet in just a few minutes without burning the roadway asphalt. It heats the roadway to 300º Fahrenheit. This allows the potholed area to be reshaped with a rake and eliminates the use of a compressor and/or other tools to square up the hole. It also allows the crew to use the existing roadway asphalt, thus saving on patching material. Additional hot asphalt is stored in the front compartment of the unit. The hot mix is accessible from either side of the machine. After compaction of the area, a seal coat of 50% CRF rubberized crack sealing oil and water is applied. Finally, blotter sand is then spread over the patch to control tracking from traffic.

All heating of the asphalt is supplied by six twenty-five pound propane tanks mounted on the trailer. There are four tanks dedicated to the infrared heaters and two additional tanks for heating the bulk patching material in the hopper.

Idaho has used this equipment to repair potholes as well as alligatored areas. It is also useful in reshaping areas that have rutted or shoved. The results are a smooth and compacted roadway surface with an expected life equal to the adjacent roadway. An additional benefit of the **Poweray Infrared Heat and Serve** system is that it can be used in any weather and at any temperature. If patching has to be done in extreme conditions such as well below freezing, this machine will heat the roadway Potholes and allow the patching operation to continue with acceptable results.

Durapatcher:

The **Durapatcher** velocity patcher is a trailer mounted system that allows for a fast, clean and efficient method to fill potholes, depressions and alligatored areas. Using an engine driven cyclone blower, the **Durapatcher** cleans the damaged area with a stream of forced air. Once clean, the area is sprayed with an emulsified asphalt (CRS-2). The tack coat waterproofs the area from the bottom and serves as a bonding layer to hold the repair. Aggregate for the patching operation is carried to the job site in a small dump truck with a modified tailgate. The aggregate gravity flows into a hopper at the front of the trailer where it is picked up by the flowing air and carried to the nozzle. The aggregate used is clean ¼ inch seal coat chips. The aggregate is blown through the spray of emulsion at the nozzle and placed into the area of repair. This spray procedure allows for no cracks or faults between the old and new asphalt surfaces. Once the pothole is filled the oil is turned off and a light coating of dry aggregate is applied to the surface. This cover coat isolates any oil from the vehicle tires and allows for immediate resumption of normal traffic flow. There is no compaction required in this operation.

To repair potholes with the **Durapatcher** requires a crew of two: one to drive the truck and one to operate the patcher. While you may need additional personnel for traffic control, the two man crew can easily patch up to twelve cubic yards of patching material in a single day. Easy clean up is another advantage with the **Durapatcher**. There is no open flame on the unit. A hot water jacket, supplied from the engine cooling system maintains the oil temperature during the day and electric heat blankets keep the oil hot at night. Any oil remaining in the nozzle at the end of a patching operation is quickly dispensed into a hopper at the front of the unit, and the oil is replaced with diesel during storage. There are no augers or other high maintenance moving parts on the **Durapatcher**. This keeps down time to a minimum. **SHRP** tested the spray injection system and found it to be one of the most cost efficient patching methods available. ITD has found it to be one of the most durable as well.

Continued on Page VI, Col. 1

Potholes (Cont. from Page V, Col. 2)

Conclusion:

As a result of utilizing these two pieces of equipment, Idaho has been able to better keep up on the repair of potholes this Spring. The Department recognizes that no one piece of equipment will be perfect for all maintenance operations. However, the **Poweray Infrared Heat and Serve** and the **Durapatcher** have added two valuable tools to Idaho's arsenal in the war to maintain our highways.

FY 99 Research (Cont. from Page II, Col. 2)

Better decisions regarding land closures, detours, etc. could be made if the total costs of various options could be estimated and weighed against benefits. In Phase I, a search was conducted for any existing models. Phase II will validate the method of speed estimation using road geometry and traffic volumes developed by two other states, develop an "expert system" to estimate total vehicle delay for work zone traffic plans, and adapt the winter maintenance cost-benefit model to estimate the cost of the traffic delay.

(Research Project 131, Phase II) **Development of Microstation Tools to Compute Circuit Requirements or Lighting Design Elements.** The objective of this project is to develop a Microstation application to calculate circuit requirements for various electrical circuits in illumination and signalization, create tagged element data from the design, develop a database and create a conductor/circuit schedule and material quantity plan sheet with cost estimates. Design and coding of software prototypes were completed. This phase will focus on development of the final software tools and their testing.

(Research Project 133, Phase II) **Development of Microstrain Data Acquisition System**. The objective of this research is to complete development of an electronic-data acquisition system sensor which has been under development in the ITD Traffic section for at least a year. Fourteen analog subsystems are to be fabricated and deployed for field-testing. Testing will include variable weight correlation and determination of the stability of the system under a wide range of temperatures. The target-data acquisition equipment has been purchased. Activities this year include development of databases from variable weight and extended temperature investigations, completing fabrication of 14 field equipment analog subsystems, and initial field trials of target field processor system.

(Research Project 139) **Vegetation Management Practices for Soil Stability, Erosion Control and Slope Maintenance**. The success of slope engineering, slope stabilization and revegetation efforts are dependent on each other. The objectives of this project are to investigate synergistic approaches to erosion and sediment control. It will include development of roadside vegetation case studies, facilitation of statewide workshops for training and information exchange, preliminary evaluations of topsoiling to facilitate revegetation, and second year observation on established test plots to evaluate seed application rates for hydroseeding roadway slopes.

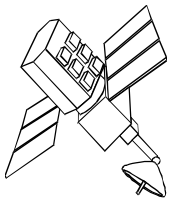
(Research Project 140) **Revisions and Modifications to WINPSBRG (Prestressed Bridge Girder Design Program)**. The AASHTO Manual on which the WINPSBRG program is based has undergone several revisions during the year in which the program has been in use, the program will be updated to be consistent with the 16th Edition of the AASHTO Bridge Design Manual. Secondly, the program will be modified to incorporate changes and suggestions from ITD staff, resulting from the first year's use of the program.

(Research Project 142) **Rock Fall Hazard Classification and Mitigation – Phase I**. The objectives of this study are to identify and prioritize rock fall hazard sites so that mitigation funds can be allocated efficiently and to improve highway conditions for enhanced safety and rock fall maintenance. FHWA and available state DOT procedures for rock fall hazard classification and rating will be reviewed and modifications recommended for use in Idaho. Trial field evaluations will be conducted and further modifications made to the procedures, which then will be computerized. An initial hazard ranking / prioritization system will then be developed that incorporates factors external to the rock slope, such as traffic volume, maintenance costs, public visibility, etc.

(Research Project 143) **Evaluation of Earthwork Savings in Road Design using ROADZ**. This project will evaluate the capabilities of the ROADZ computer program to optimize earthwork quantities in rural

roadway design. The program, originally developed for the Forest Service, uses the least squares theory to adjust the profile grade to balance the earthwork. It is believed the optimizing capabilities should be applicable to higher standard roads. Some past rural designs will be given a re-design using ROADZ. If the earthwork savings are found to be significant, the earthwork adjustment feature of ROADZ will be incorporated into the program currently used by ITD for roadway design.

(Research Project 144) **Use GPS Technology to Update the Idaho Transportation Dept. GIS**. The objective of this project include: 1) Examine the needs of ITD for GIS-T products, 2) Examine the quality and extent of the GPS data collected by ITD and how or whether it can be used to update or develop a GIS-T system, 3) Determine the need and cost-effectiveness of making additional GPS runs to augment data if gaps are identified in the previous step, 4) Write code to filter and extract information from the GPS data files, 5) Import GPS data into an Intergraph MGE design file, and 6) Identify and suggest ways of enhancing the use of ITD's GIS-T system.



(Research Project 145) **Beneficial Effects of Lime Added to Asphalt Cement in Asphalt Concrete Mixtures**. The objective of this research is to determine the feasibility and economics of using lime-modified asphalt binder in the asphalt concrete mixture design. The beneficial effects of lime, added to the aggregate in asphalt concrete mixtures, are well known. However, the equipment needed to add lime to the aggregate is not universally available in Idaho and there are environmental and health issues associated with the addition of lime, either dry or as a slurry. The effects of lime, when added directly to the asphalt cement, have not been documented. Conventional and Superpave binder and mixture analysis tests will be performed on asphalt concrete mixtures both with and without lime-modified binder.

(Research Project 146) **Bituminous Mixture Design by Triaxial Compression.** The purpose of this research is to develop and use triaxial compression testing methods with pore pressure measurements under environmentally controlled conditions in asphalt concrete mix designs. The obtained shear strength properties of the asphaltic concrete mixture will be correlated with current required mix design parameters, such as percent air voids, asphalt content and Hveem stability. The duration of this phase of the project is expected to be two years

(Research Project 147) **Development, Adaptation, and Monitoring of Interactive Training Courses to Idaho Transportation Department's Intranet and the World Wide Web**. The objective of this study is to address the problem of developing and adapting interactive computer modules for "on-site" and "on-demand" training for ITD's technical staff in the field and an efficient tracking system for training information. The current courses available, require special computer equipment only available at headquarters. This training can be downloaded to PCs located in each of ITD's maintenance sheds through the Department's Intranet, or the World Wide Web if appropriate. The project will include the adaptation of the two existing AASHTO courses, locating other available courses and developing a system for obtaining new courses meeting ITD's needs.

(Research Project 148) **Performance Prediction Using Densification Characteristics of Idaho Superpave Mixes**. The main objective of this research is to evaluate the performance of the Idaho Superpave asphalt mixes during construction and its rutting potential during its service life. One of the unique features of the Superpave volumetric mix design is the use of the gyratory densification curves to account for two phenomena of compaction: compaction during construction and densification under traffic. This project will investigate the effect of mixture components on the densification process and study the relationship between the gyratory compaction curve characteristics and permanent deformation (rutting) in pavements.

This is expected to be a two-year project

(Research Project 149) **Fleet Vehicle Demonstrations of Alcohol-Water Fuel and Catalytic Ignition System**. The objective of this study is to investigate the performance, durability and emissions of an alternative alcohol-water fuel and catalytic ignition system for fleet vehicles operating under road conditions. The two test vehicles will be a public transit van provided by Valley Transit of Lewiston, ID and a pickup used by the State Energy Division. Baseline tests on performance, emissions and engine wear will be conducted for both the van's gasoline

Continued on Page VIII, Col. 1

FY 99 Research (Cont. from Page VII, Col. 2)

engine and the pickup's diesel engine. Tests will then be conducted on both engines at 10,000, 25,000, and 50,000 miles.

This is a two-year project.

(Research Project 150) **Demonstration Project for Revegetation of Highly erodible and Steep Slopes**. ITD has a large number of steep cut or fill slopes that continue to erode or fail in part due in large part to the lack of sufficient and the right kind of vegetative growth. These eroding slopes present a continuous and expensive management problem to ITD.

Previous seeding practices, usually during construction, using standard seeding methods on steep slopes have proven to fail in almost all instances. It can now be documented and proven that the exposed slopes lack the necessary organic matter, nutrients, and beneficial soil microorganisms, to grow and sustain desirable vegetation.

This project will test the limitations of relatively new products, technologies, and plant species selection on steep sterile, and highly erodable slopes. The slopes selected to be treated with this new concept will add up to one acre increments, consisting of several sites and check strips within a given location. The application of product will be performed under field conditions. A total of 12 acres within predetermined locations is scheduled for this treatment.

A professional contractor /applicator will be retained, who will provide all necessary product/ seed/ application on a per acre basis. ❁

✺✺✺✺✺✺✺✺✺✺✺

AASHTO RAC (Cont. from Page IV, Col. 1)

In the past, SCOR and FHWA have had fairly free hand in managing their funds. It has been difficult to sustain high cost, long-range research. There is a high risk factor, however the payoff is also high.

Bob feels that adequate funding will continue to be a problem – FHWA will be worse off at end of this period. There will be less control of programs by research managers and more direct involvement by Congress in earmarking funds. Congress will require seventy-six (76) special studies. FHWA has not figured out what the cost of the studies will be. We need to build on the success of the National Cooperative Highway Research Program (NCHRP) to work cooperatively among the states on research of national importance.

Session 5 - Research and Technology Program Reauthorization, presided over by Bob Betsold, addressed many of the funding details of **TEA 21**. The bottom line is that under **TEA 21**, FHWA has much lower funding levels to continue ongoing research due to the large percentage of the funds that have been earmarked by Congress. Under **TEA 21**, all R&T program funding must come out of contract authority - no FHWA general operating expenses (GOE) funds can be used for R&T as it could in the past. The total **TEA 21** R&T is approximately 40% lower that what was proposed to Congress, but it is 5% higher than in ISTEA. An approximate 50% increase in the State Planning and Research (SPR) program was realized due to a legal decision allowing FHWA to apply SPR to the guaranteed minimum of 91% to the states.

Bob went through the funding available for FY 98 and FY99 in Surface Transportation Research Programs, and showed the amount of flexibility available in each of the R&D Program areas. He also went through the funding available for Technology Deployment for FY98 and FY99. In FY99, there really is very little flexibility available for FHWA.

Under the University Transportation Research program, ten Centers will compete for a total of $60 Million over the 6 years of the **TEA 21**. Twenty-three universities or groups of universities are earmarked to receive $134.8 Million total over the 6 years.

Issues raised by **TEA 21** include: what are the national priorities, who are the players, what will be the role of SHRP II study (in **TEA 21**), and what are the appropriate pooled funds/state lead roles? Potential options include 1) a mandatory takedown pooled fund to be administered by FHWA/AASHTO/TRB, 2) incorporating new activities under the NCHRP - pick up on-going topics or new starts from Strategic R&T Plan and 3) more "regional" pooled fund studies.

Bob indicated there is a need for FHWA to work with their partners to articulate a national R&T agenda. This would include collaborating with designated institutions to coordinate work toward the national R&T agenda. Priorities for in-house and contract R&T need to be tightened - linked to the strategic plan and clearly

defined federal role. FHWA needs to leverage funds and see where the states can pick up the slack.

Most people seem to want a national pooled fund effort. The real question seems to be at what scale and under what process. Possibly NCHRP and RAC could help with the administration of this program. Bob would prefer to see a "program" of national pooled fund efforts, not just individual projects. Projects with a common theme and build on one another are more cost effective to administer than a number of individual projects.

Another question raised by **TEA 21** and the reorganization of the FHWA is - what role the FHWA will have in Regional Pooled Fund studies now? They could be handled in the new FHWA Resource Centers, but only if the positions are available for them.

FHWA has been mandated to develop a National R&T Strategic Plan by next spring to bring to Congress for the next appropriation bill. They need to work with the states in developing the plan. Each state should bring their needs into this process.

Bob Reilly reminded the attendees that NCHRP is the states program, so NCHRP will do what SCOR and RAC want. A pooled fund program is a possibility and he is open to that.

Session 6 - Federal / State Research Coordination, also presided over by Robert Betsold, addressed the need to determine new relationships between federal and state research efforts. This includes the need to determine a mechanism for states to fund research where FHWA has a shortfall but the states feel the work needs to be continued. Of probably greatest interest to the states are the SHRP and LTTP programs

John Conrad, new Chair of AASHTO SHRP Implementation Task Force, was present to discuss saving the SHRP program (making sure that our investments pay off), address the resolution of the Mississippi Valley Conference (AASHTO Region 3) on funding for the LTPP program, and decide what actions the SHRP task force needs to take. He indicated the SHRP program has always had much state involvement. Under **TEA 21** funding, LTPP received $9 million of the $16 million needed, Superpave needed $11 million and got zero, and winter maintenance and preventive maintenance both also received zero.

On **LTPP**, John said that the perceived problems in data collection and quality of data really are not that bad and the data is good and useable. The Task Force has looked at the funding available and come up with a table of shortfalls, highest priorities, etc. They are suggesting pooled fund studies and money to NCHRP to fill in the gaps in funding.

The **Superpave** Lead State team has been very strong. The team does an annual survey of the states on implementation of binder and mix design. They have also surveyed the states on barriers to implementation and come up with a list of areas that need work to increase implementation. Support for Superpave must be found. If not, items that will fall out will include training, Superpave Centers, and model development. The AASHTO SHRP task force is proposing a national pooled fund study to fund these activities.

Robert Betsold addressed shortfalls in other areas of the federal R & T program. These include:

High Performance Steel - a shortfall of $1.7 million. This includes metallurgical development, design, and streamlining fabrication.
Innovative Finance - a shortfall of $600,000.
Asset Management - Design and Analysis Systems shortfall is $2.5 million, Evaluation & Monitoring Tools shortfall is $2.5 million, and Management Systems shortfall is $1.5 million.
PM2.5 Models in the Environmental Program - shortfall is $4 million.
National Personal Transportation Survey (NPTS) - shortfall is $3.2 million.
International Technology Scanning Program - for scaled back version, shortfall is $500,000 and for the full program wanted, shortfall is $807,000.
Highway Storm Water Non-point Source Predictive Model and Best Practices - shortfall is $500,000.
Watershed Planning and Modeling - shortfall is $500,000.
Hydraulics - shortfall is $700,000

According to Bob, the states need to identify their needs and what they may want to help FHWA support. The national R&T strategic plan is also in the mix. FHWA has only a short time to figure out how to proceed.

Bob also suggested that the NCHRP could handle items that have national impacts. However, the determination would have to be made by SCOR if it involves a long-term commitment to a program (such as LTPP data collection and other SHRP implementation).

Continued on Page X, Col. 1

AASHTO RAC (Cont. from Page IX, Col. 2)

George Ostenson of FHWA suggested that people are currently in a reactive mode. We really need to create a national R&T agenda so that we have some strategic thinking about really needs to be done, rather than just reacting to specific areas having shortfalls. What should be the process and who should be the players in strategic planning? Dave Huft, Chairman of AASHTO RAC indicated that the question of funding shortfalls would be addressed by each of the AASHTO Regions during their breakout sessions.

The WASHTO Breakout Session focused almost exclusively on the issue of funding shortfalls in the national research program. There was a consensus that the first step should be to identify all of the time critical elements in the current national research program that faced an immediate loss of funding at the federal level, such as WesTrack. There was little support for a program of mandatory takedowns from the States' SPR funds.

LTTP should involve a limited time investment. The states should not be pushed into a long term Commitment. There is a need to determine what remains to be done to implement **Superpave.** Questions raised included: what are the most critical items (details need to be looked at by FHWA and the Materials Sub-Committee), which items can be handled through NCHRP, and are there any critical areas that wouldn't fit under NCHRP but are important to the states?

A Draft AASHTO Research Advisory Committee Resolution, based on the discussion by the WASHTO RAC members, was put together preparatory to the development of a consensus resolution that could be supported by all four regions. The three main points included in the draft were:

1. That emergency, interim, and long-term strategic funding and management plans need to occur, which may include the use of unobligated 1998 NCHRP funds and SPR funds.

2. That the 1998 NCHRP additional funds be used to provide continuation of the current active FHWA projects, ie: WesTrack, Superpave Models, et al to allow continuation of the projects in the short-term.

3. That the existing FHWA/TRB/RAC committees will be used to develop funding options for balloting and prioritization by the States.

Based on the input from the four regions, RAC leadership developed a series of talking points. The results will be passed forward to SCOR following feedback from the membership, and further refinement.

Research Management Issues:

One of the more important sessions dealt with the overall of effectively managing a research program. The question was examined from the point of view of executive management, program management and private industry.

Developing Executive Support and Meeting Executive Expectations, according to Tom Hart – Deputy Commissioner of Tennessee DOT, involves putting a strong emphasis on research meeting the needs management. In the past few years, the TN DOT has dramatically improved and increased the amount of research projects that they are doing. They are doing research in most program areas and have identified real cost savings. The management is very aware of these successes. Saving taxpayer money is what will continue to make research money available. All of the best private companies spent a lot of money in research - DOTs should be doing the same.

The R&D Program as A Strategic Resource was the subject of a panel by Eric Harm, Illinois DOT and Bob Benke, Minnesota DOT. They have both done a lot of work during this past year to present to management the concept that research is an asset to state DOTs.

Eric offered the following points:

Research should be a change agent.
Research should be **pro-active**: Conduct an environmental scan to determine what is going to become a problem in the future and prevent it from happening.
We talk to our counterparts, therefore are more apt to have the big picture of what is happening throughout the organization.
Researchers are **information brokers**: Knowing where to direct people to get the right information (information is vital to good strategic planning).
Researchers have access to many people, including those with industry, which other people in DOTs don't have.
Libraries are very important in the information game.
Need to be able to answer the question from CAO, **"What have you done for me recently?"**

Bob addressed the issue of Strategic Management with the following points:

- Need to shift the emphasis from research being the target to research being a weapon for Management to accomplish mission.
- Research agenda should be a product of the organization's strategic management process, not an independent venture – address the priority needs of the organization.
- Strategic management has vision, mission, values, and strategic direction – need to know who needs to do what and why.

Bob also addressed the need for **Just-in-Time** Research:

- Research Managers should be **involved** in the strategic management process.
- Research should be viewed as a strategic management asset.
- Every employee must feel a sense of urgency needed to inspire self-motivational learning.

Bob ended his presentation with the thought, *"**In a time of drastic change, it is the learners who will survive. The learned find themselves fully equipped to live in a world that no longer exists".***

Ensuring and Evaluating R&D Program Effectiveness was the subject of William Agnew, General Motors Corp. (Retired). Lessons from GMR Experience include:

There needs to be a balance between research and development.
There must be good relations with the Operating Units – trust and respect.
There must be good relations with universities.
Long range research must be relevant.
You can not farm out all of your long range, basic research to universities. Also, giving a professor a bunch of money and saying see you in a year does not work. You must be able to guide and monitor this work with in-house staff.

Selecting Research Projects to Support Department Missions is essential to an effective and management supported research program according to Douglas Anderson, Utah Dot. He presented three key points:

1. Process is customer driven – you must address the Department's strategic goals, Division's issues and Region's problems.
2. Need to help agency with solutions to problems and finding innovations for improvement.
3. If it isn't broke, it can still be improved.

Scientific Method and Ethics were addressed by David Manning, Ontario Ministry of Transportation and Communication. **Professional and ethical research practices** must be followed at all levels of the research process, according to David, from Project Leader to Research Manager. The key points he stressed included:

- Full disclosure of experimental techniques and data required so others can reproduce the results.
- Values and bias need to be identified.
- Any conflict of interest must be declared before the work begins.
- Publication and openness is a must.
- Allocation of credit where it is due should always be done – helps put the work in context of where the work fits into the rest of the field. Any value added should be identified.
- Error, negligence and misconduct must be pointed out when found.
- Vigilance and intellectual challenge must be always present.
- Violations of ethical standards need to be addressed when found.

An important point to remember is that ***"Eminence should not preclude scrutiny. Many famous scientists of the past have been found to have not reported all of the truth".*** When resolving allegations of scientific or professional misconduct, David listed five principles:

1. Act promptly and don't ignore it.
2. Follow principles of fairness towards the accused and protection of the accuser.
3. Investigate thoroughly.
4. Follow established adjudication and appeal procedures.
5. Document the process.

For those desiring a full report on the meeting, a copy of the report can be obtained from the Materials Section at 208-334-8267.

Additional Internet Sites of Interest

ASSOCIATIONS	
AASHTO's Product Evaluation Listing	http://tti.tamu.edu/prodeval/
AASHTO Quality Clearinghouse	http://tti.tamu.edu/quality/
American Road & Transp. Builders Assoc.	www.artba-hq.org
Multi-State Tech. Assistance Prog. (Transit)	www.mtap.org/intro.html
COMPUTER SOFTWARE	
Trip Generation by Microtrans	www.tripgeneration.com/
EDUCATIONAL INSTITUTIONS	
Alliance for Transportation Research Institute	www.unm.edu/~atr/
Center for Transportation Research & Education – University of Iowa	www.ctre.iastate.edu/index.htm
McCormick School of Engineering & Applied Science	www.tech.nwu.edu/
GOVERNMENTAL AGENCIES	
DOE National Transportation Program	www.ntp.doe.gov/
DOE Transportation Energy Efficiency	www.eren.doe.gov/EE/transportation.html
DOE (INEEL) Transportation Infrastructure	www.inel.gov/capabilities/transportation/
Federal Railroad Administration Office of Research & Development	www.fra.dot.gov/o/dev/index.htm
FHWA Active Pooled Funds Studies	www.tfhrc.gov/site/fund.htm
FHWA Anti-Icing Virtual Clearinghouse	www.ota.fhwa.dot.gov/icing/
FHWA Priority Technologies Program	http:/6005.fhwa.dot.gov/ptp
National Technical Information Service Online Ordering Service	www.fedworld.gov/ntis/ordering.htm
Oregon DOT Research Office	www.odot.state.or.us/tdb/research/index.htm
TEA-21	www.fhwa.dot.gov/tea21/index.htm
Utah DOT Research & Development	www.sr.ex.state.ut.us/html/research.htm
US DOT Res. & Special Programs Admin.	www.rspa.dot.gov/
US Government Printing Office	www.access.gpo.gov
Washington DOT Research Office	www.wsdot.wa.gov/ppsc/research/rpage.htm
Washington State Transportation Center (TRAC)	http://weber.u.washington.edu/~trac/
ORGANIZATIONS	
Local Technical Assistance Program (LTAP) newsletter articles	www.ltap.org
Transportation Research Information Service	www.nas.edu/trb/about/tris.html
TRB Publications Index	www.dcdata.com/trb/trb.htm?

The **Transportation Research Bulletin** is published quarterly by the Idaho Transportation Department Research Office. The information, findings, views and recommendations in this publication reflect the views of the authors and are solicited from reliable source. However, they do not necessarily reflect the views of ITD or the FHWA. ITD makes no guarantee and assumes no responsibility for their accuracy, sufficiency or completeness.

Letters or articles are welcome.

STAFF

Asst. Mtls./Research Engineer
Bob Smith - 208-334-8437
or bsmith@itd.state.id.us

Editor/Lab Research Engineer
Stephen Loop - 208-334-8267
or sloop@itd.state.id.us

HOME PAGE

www2.state.id.us/materials/Research/research.htm

Idaho Transportation Department
Post Office Box 7129
Boise, ID 83707-1129